NetStreams™

ClearOne®

Musica™ - NS-MNE Musica Network Interface

NS-MNE and iMusica Installation and Operation Manual

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Chapter 1: Introduction

PRODUCT OVERVIEW

The ClearOne NS-MNE Musica Network Interface adapter connects the Musica™ MU5066ADC RS-232 connector to an RJ-45 Ethernet connection allowing IP-control of the Musica system through an Adobe® Flash®-enabled browser or using the iMusica application with an Apple® iPhone®, iPad® or iPod touch®.

The NS-MNE is compact in size and the software is built in so it requires no programming. Simple configuration is all that is required to take IP-control of the Musica system.

In addition, up to 3 MU5066ADC units can be connected using 3 NS-MNEs to make an 18-zone system.

» Note: Installing one or more NS-MNE units is essentially the same, however, this guide assumes multiple NS-MNEs are being installed and configured.

Browser Operation

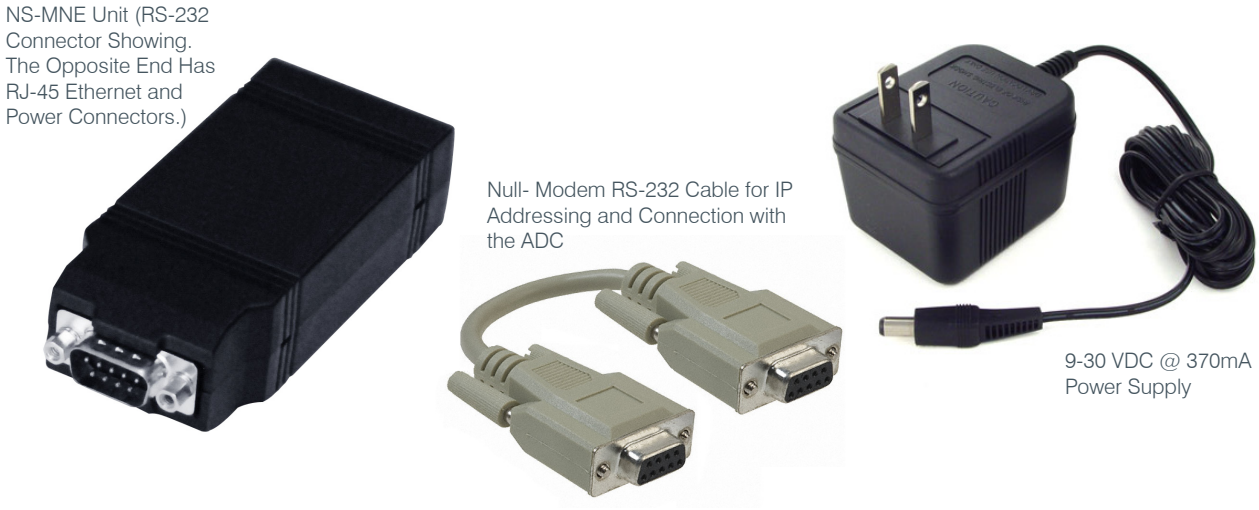
PC's, tablets and smartphones with Flash enabled browsers access and control the NS-MNE over its Ethernet connection from a GUI generated within the unit.

iMusica Operation

iMusica is an application written for use with the Apple iPhone, iPod touch and iPad products that provides the same functionality using an optimized interface. It additionally provides access to an iTunes Library running on a networked computer.

PACKAGE CONTENTS

The following illustration shows the parts that ship in the box with the NS-MNE.


NS-MNE Unit (RS-232 Connector Showing. The Opposite End Has RJ-45 Ethernet and Power Connectors.)
Null- Modem RS-232 Cable for IP Addressing and Connection with the ADC
9-30 VDC @ 370mA Power Supply

» Note: ClearOne is not responsible for product damage incurred during shipment. You must make claims directly with the carrier. Inspect your shipment carefully for obvious signs of damage. If the shipment appears damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

HARDWARE REQUIREMENTS

To complete an installation for one or more NS-MNE's, you will need:

- NS-MNE (one for each MU5066 Audio Distribution Center®)
- NetStreams Musica MU5066 Audio Distribution Center (ADC)
- An Ethernet Switch/Wireless Router
- A computer running MS-Windows
- Ethernet cable
- RS-232 cable

All units require power cables

SOFTWARE REQUIREMENTS

The software required to install and configure the NS-MNE includes:

- Computer running Windows XP, SP2 or higher (for configuring the IP Address of the NS-MNE)

For PC's, tablets and smartphones

- Adobe Flash running on the web browser
- Windows XP, SP2 or higher (for configuring the IP Address of the NS-MNE)
- A Flash-compatible web browser
- MNE_Finder.exe for discovering and configuring the NS-MNE (Download from the Musica Tools area in the Resource Library of the NetStreams website.)

For iPads, iPhones, or iPod touch devices

- iMusica (Downloadable from the Apple Apps Store)

INSTALLER REQUIREMENTS

This manual assumes the installer:

- Knows how to install a Musica MU5066ADC system
- Knows how to use basic installation tools such as an RJ-45 crimper to terminate CAT5e wire
- Has pulled the required wires to the locations where the keypads and speakers are installed
- Understands basic MS-Windows commands; such as how to browse, create and save files and folders, etc.

INSTALLATION AND OPERATION OVERVIEW

This Installation Manual will guide you in all the tasks to configure the NS-MNE Musica Network Interface adapter, install the NS-MNE, and how to access the Flash GUI and iMusica software used in it's operation. These include:

- Installing and Configuring the NS-MNE
    - In-Network Method
    - Standalone Method
- Using the Browser NS-MNE Interface
- Downloading, Configuring, and Using the iMusica Software
- Using iTunes with iMusica

Chapter 2: Installing and Configuring the NS-MNE

Each NS-MNE must be installed and configured with the information needed to uniquely identify it and for it to communicate with both the Ethernet network and its Musica MU5066ADC.

Configuring Methods

There are two methods which can be used to do this depending on your situation and preferences:

In-Network Method - Configuration can be accomplished after connecting the devices to the Ethernet network using the MNE_Finder application to identify and configure the devices. This the recommended and easiest method.

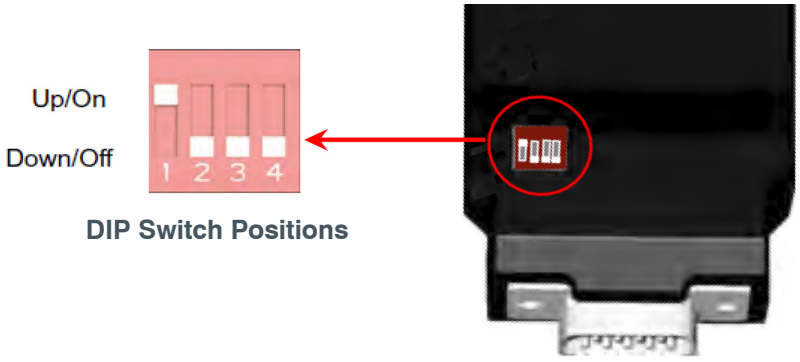
Standalone Method - Allows configuring the information into the NS-MNE devices before connecting them into the network, such as before installing at the customer site.

» Note: Configuration must be performed for each NS-MNE that is to be installed in the system. Up to 3 NS-MNE's (and the accompanying Musica ADC's) are allowed creating up to 18 zones.

IN-NETWORK METHOD

To configure the NS-MNE devices in-network, complete the following steps by referring to the diagrams below:

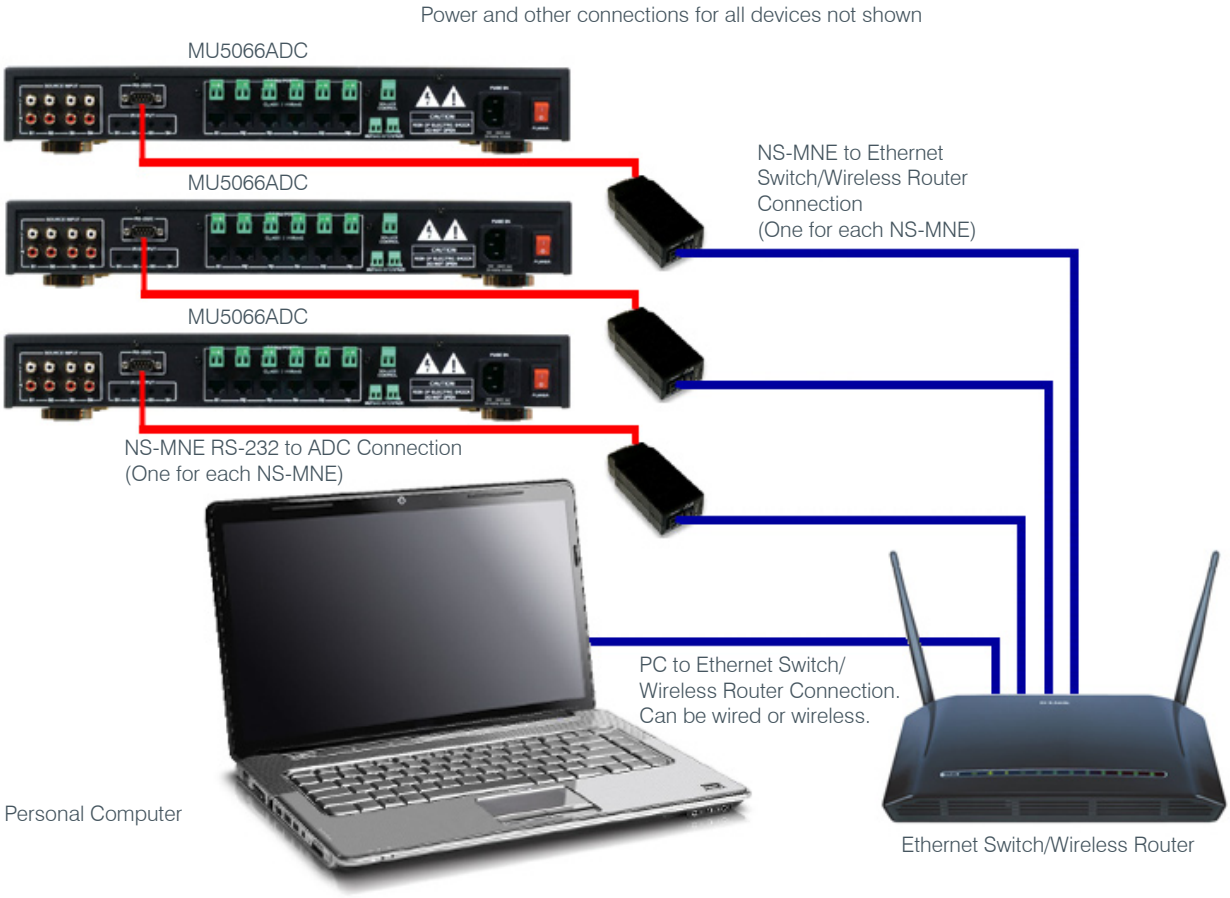
1. Verify the DIP switches on the bottom of the NS-MNE unit are in the proper positions as shown:



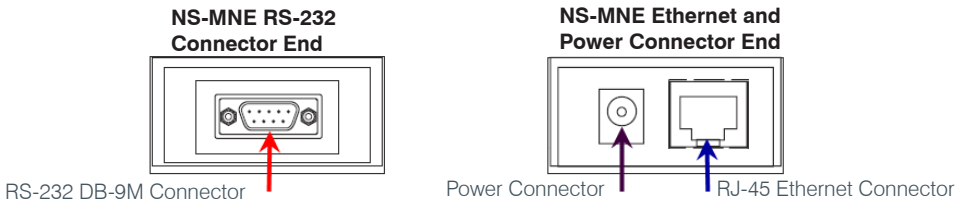
2. Connect each NS-MNE to the Musica MU5066ADC it will control using its null modem cable.
3. Connect the Ethernet port of each NS-MNE to the home Ethernet network switch.
4. Connect the PC to the home Ethernet network; wired or wirelessly.
5. Ensure all power cables are plugged in.
6. Start the computer.

An 18-zone connected setup including 3 Musica ADC's and 3 NS-MNE interfaces would appear like this:

Home Network with 3 Musica ADC's and 3 NS-MNE's Comprising an 18-Zone System


Power and other connections for all devices not shown
MU5066ADC
MU5066ADC
MU5066ADC
NS-MNE to Ethernet Switch/Wireless Router Connection (One for each NS-MNE)
NS-MNE RS-232 to ADC Connection (One for each NS-MNE)
PC to Ethernet Switch/ Wireless Router Connection. Can be wired or wireless.
Personal Computer
Ethernet Switch/Wireless Router

NS-MNE Connectors



Information Required

You will need to provide the following information for each NS-MNE as you configure:

- Static IP Address
  - » Note: In systems where more than one NS-MNE is configured, the IP addresses that are assigned must be sequential. For example, the first NS-MNE could be 10.15.100.150, then the second would be 10.15.100.151, and the third 10.15.100.152.
- Subnet Mask
- Gateway Address

You will also need the MAC Address of each NS-MNE device (printed on bottom of the unit)

Discovering and Configuring the NS-MNE Units

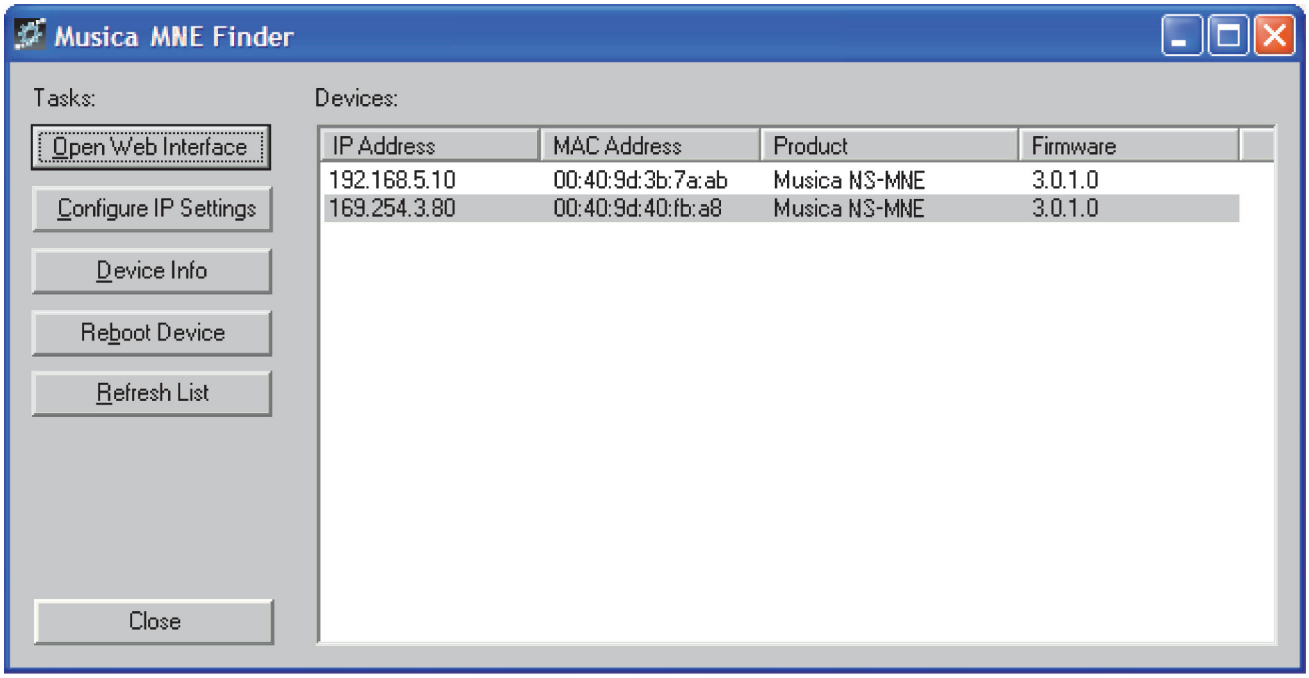
The MNE_Finder application running on a PC connected to the network discovers any NS-MNE units that are connected via the local Ethernet even if their current IP address settings are incompatible with those of the PC running the program.

Running MNE_Finder

Make sure each NS-MNE unit is powered on and connected to the Ethernet network via its Ethernet port.

On a PC running Windows connected to the same Ethernet network, run the MNE_Finder.exe program. The program automatically discovers and shows a list of all connected NS-MNE units along with their current IP address, MAC address, and firmware revision.

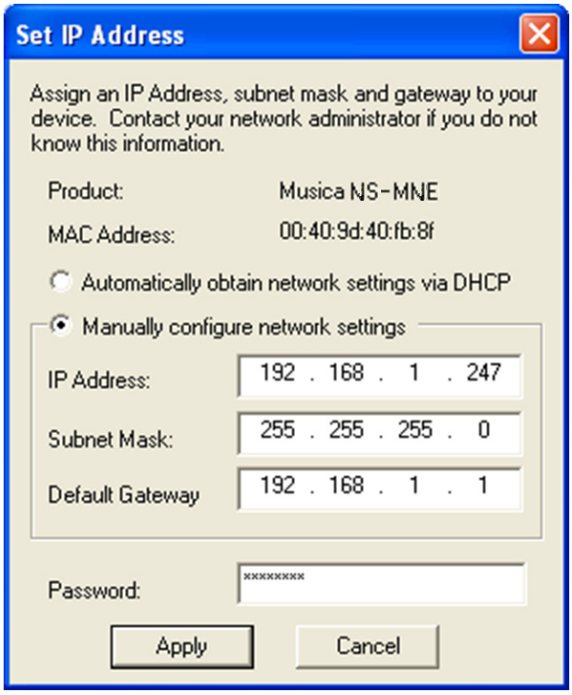
If you need to repeat the discovery, press the “Refresh List” button.



CONFIGURING WITH MNE_FINDER

To configure, perform the following:

1. Identify the NS-MNE unit you will configure by the MAC address that is listed by the MNE_ Finder.
2. Select it then click the **Configure IP Settings** button.


Set IP Address
Assign an IP Address, subnet mask and gateway to your device. Contact your network administrator if you do not know this information.
Product:
Musica NS-MNE
MAC Address:
00:40:9d:40:fb:8f
Automatically obtain network settings via DHCP
Manually configure network settings
IP Address:
192 . 168 . 1 . 247
Subnet Mask:
255 . 255 . 255 . 0
Default Gateway
192 . 168 . 1 . 1
Password:
****
Apply
Cancel

3. Enter the IP Address, Subnet Mask, and Default Gateway for the device.
4. Enter the password, which is "**sysadm**" (the field is case sensitive).
5. Click on **Apply** which pushes the address into the device over the network. After the information has been sent to the device the MNE_Finder main screen will be displayed (about 30 seconds).
6. Reboot the NS-MNE by either unplugging and restoring the power to the device, or by selecting the device and clicking on the **Reboot Device** button on the side panel of the MNE_Finder program. (Using the Reboot Device button requires that the password be entered.)
7. After the device is rebooted verify the IP Address, Subnet Mask and Default Gateway are as intended.
8. Repeat the process for each NS-MNE in the system.

Subsequent possible operations are available via buttons on the left hand side of the interface, which are described below. Wherever a password is needed, it will be the root password for the unit, which is "sysadm" by default.

OTHER FINDER CONTROLS

The MNE_Finder application has other controls running along the side of the screen whose functions are described below:

Device Info - Shows a summary of the information available on the NS-MNE unit.

Reboot Device - Reboots the device. Requires a password.

Refresh List - Performs a new discovery of NS-MNE devices.

Close - Closes the MNE_Finder application.

STANDALONE METHOD

Information Required

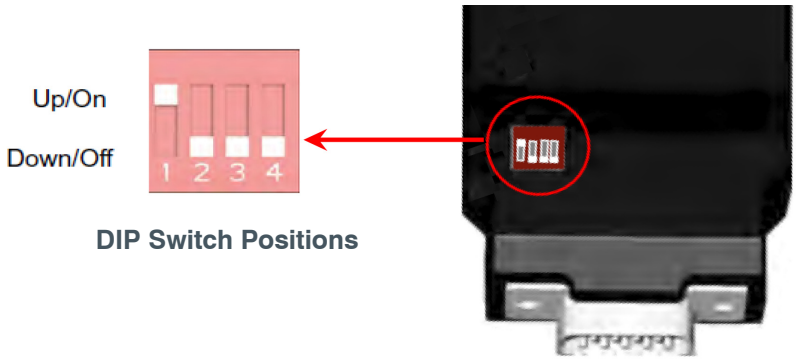
You will need to provide the following information for each NS-MNE as you configure:

- Static IP Address
  - » Note: In systems where more than one NS-MNE is configured, the IP addresses that are assigned must be sequential. For example, the first NS-MNE could be 10.15.100.150, then the second would be 10.15.100.151, and the third 10.15.100.152.
- Subnet Mask
- Gateway Address

Configuration Process

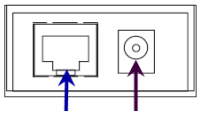
To configure the NS-MNE, connect the hardware, then use the Windows HyperTerminal or similar application to perform the configuration. (HyperTerminal can be downloaded for Windows 7.)

1. Verify the DIP switches on the bottom of the NS-MNE unit are in the proper positions as shown:



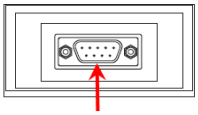
DIP Switch Positions

2. Connect the NS-MNE to the computer serial port using the null modem cable provided. **DO NOT CONNECT POWER TO NS-MNE**.



Ethernet Connector of NS-MNE not used for Standalone Configuration

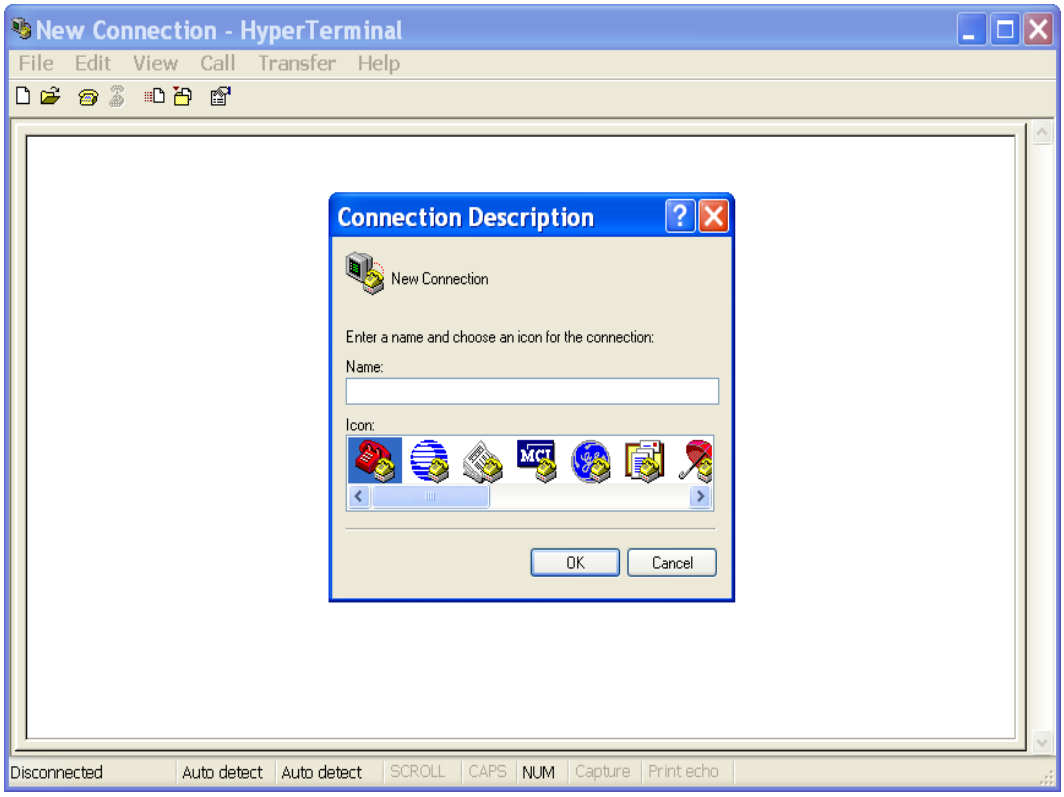
Power Connector of NS-MNE



RS-232 Connector on End of NS-MNE Connects by Null Modem Cable to PC

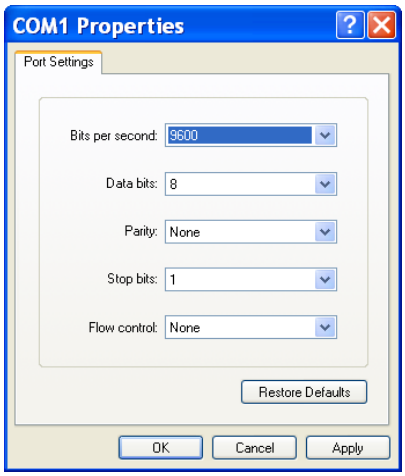
  - » NOTE: If your computer does not have a serial port, you need to use an adapter that converts from USB to serial. Note the COM port number.
3. Start the computer.
4. Establish a COM Port connection to the NS-MNE device using the MS-Windows HyperTerminal program. Select **Start>All Programs>Accessories>Communications>HyperTerminal**.

   The HyperTerminal Screen Displays



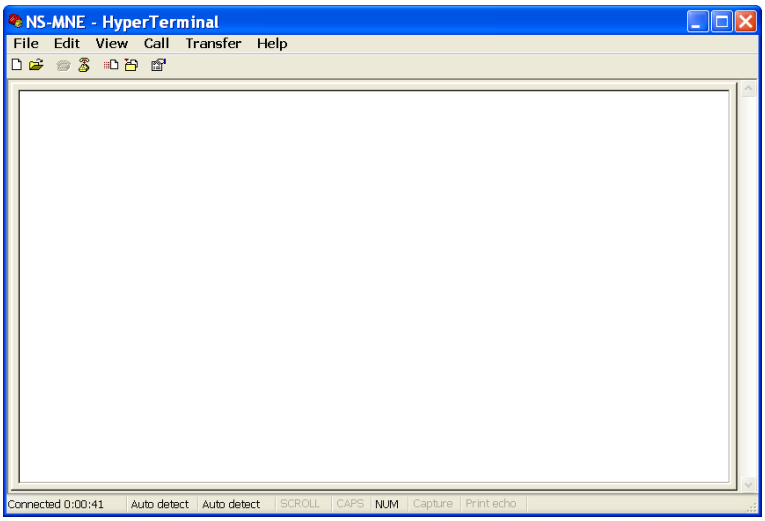
5. In the Connection Description dialog box, enter NS-MNE in the Name field.
6. Select **OK**.
   The Connect To dialog box appears

7. In the Connect Using field, select the COM port you want to use (this will normally be COM1).
8. Select **OK**.
   The COM Properties window displays



9. Select the following settings:
   - Bits Per Second: 9600
   - Data Bits: 8
   - Parity: None
   - Stop Bits: 1
   - Flow Control: None
10. Select **OK**.

    A blank HyperTerminal screen displays. The HyperTerminal application will now recognize the NS-MNE.



11. Connect the power using the Power Cable to the NS-MNE

    Wait 30-60 seconds while HyperTerminal connects to the NS-MNE. Shortly, the screen displays information for the NS-MNE and informs that you can make changes if you press any key within five seconds of the information displaying.
12. Press any key

    You are prompted to Accept or Modify the settings.

13. Enter **M** to Modify.

    You are prompted for the root password for the NS-MNE device.

14. Enter **"sysadm"** (the field is case sensitive).

15. You are prompted to enter your IP settings.

16. Enter the Static IP Address and press **Enter**.

    » Note: If you have more than one NS-MNE to configure the IP addresses must be sequential. For instance, the first NS-MNE might be 10.15.100.150, and the next two would be 10.15.100.151 and 10.15.100.152.

    You are prompted to enter the Subnet mask.

17. Enter the Subnet Mask and press **Enter**.

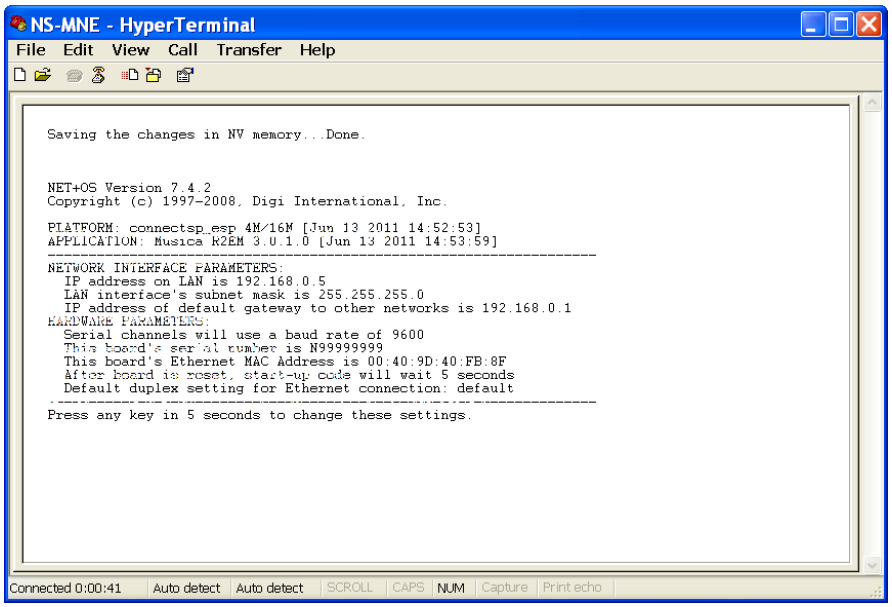
18. You are prompted to enter the Gateway Address.

19. Enter the Gateway address and press **Enter**.

20. You are prompted to change or accept other settings. Accept the defaults.

21. Accept the changes and the values are saved in NV (Non-Volatile) memory completing the configuration.

22. The unit reboots. When it has rebooted you will see the new IP, Subnet Mask, and Gateway settings displayed on the HyperTerminal.

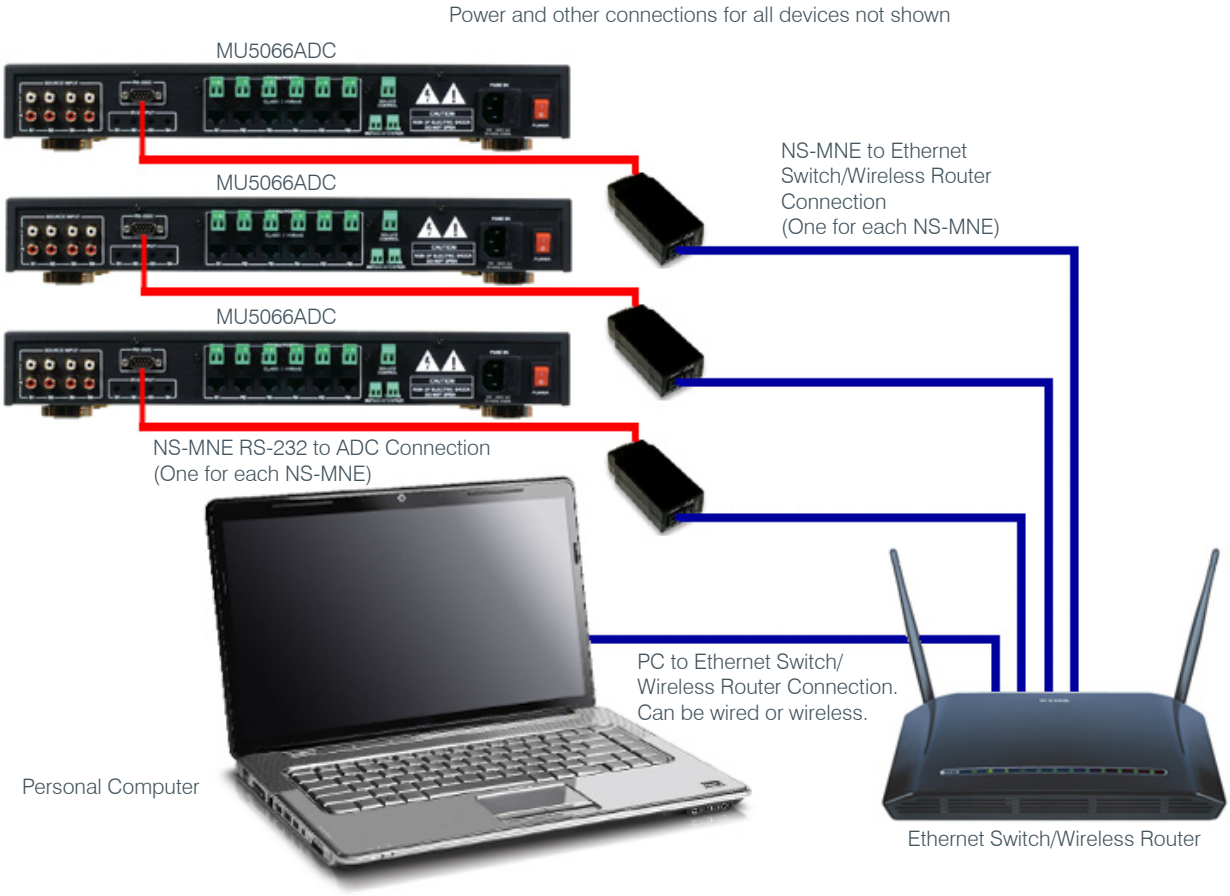

NS-MNE - HyperTerminal
File Edit View Call Transfer Help
Saving the changes in NV memory...Done.
NET+OS Version 7.4.2
Copyright (c) 1997-2008, Digi International, Inc.
PLATFORM: connectsp_esp 4M/16M [Jun 13 2011 14:52:53]
APPLICATION: Musica R2EM 3.0.1.0 [Jun 13 2011 14:53:59]
NETWORK INTERFACE PARAMETERS:
IP address on LAN is 192.168.0.5
LAN interface's subnet mask is 255.255.255.0
IP address of default gateway to other networks is 192.168.0.1
HARDWARE PARAMETERS:
Serial channels will use a baud rate of 9600
This board's serial number is N99999999
This board's Ethernet MAC Address is 00:40:9D:40:FB:8F
After board is reset, start-up code will wait 5 seconds
Default duplex setting for Ethernet connection: default
Press any key in 5 seconds to change these settings.
Connected 0:00:41
Auto detect
Auto detect
SCROLL
CAPS
NUM
Capture
Print echo

» Note: Do not make any changes to your computer or any hardware connected to the system until the NS-MNE completely reboots.

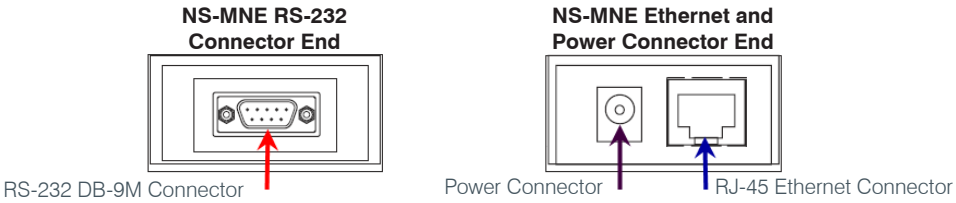
This procedure must be repeated for each NS-MNE unit to be placed in the customer network.

The following diagram shows how the NS-MNE units must be installed at the customer network. Since they have already been configured, they can then be controlled by either a connected Flash-enabled browser or configured Apple iPhone, iPad, or iPod touch device. (This diagram is also available in the NS-MNE datasheet.)

Home Network with 3 Musica ADC's and 3 NS-MNE's Comprising an 18-Zone System


Power and other connections for all devices not shown
MU5066ADC
MU5066ADC
MU5066ADC
NS-MNE to Ethernet Switch/Wireless Router Connection (One for each NS-MNE)
NS-MNE RS-232 to ADC Connection (One for each NS-MNE)
PC to Ethernet Switch/ Wireless Router Connection. Can be wired or wireless.
Personal Computer
Ethernet Switch/Wireless Router

NS-MNE Connectors



Chapter 3: Using the Browser NS-MNE Musica Interface

The browser interface of the NS-MNE can be entered by any Flash-enabled browser running on a computer, smartphone or tablet attached to the same Ethernet network as the NS-MNE. This can be a wired or wireless connection. Access the interface by entering into the browser the IP Address of the NS-MNE unit connected to the Musica ADC.

In systems where more than one NS-MNE was configured using sequential IP addresses, browsing to the NS-MNE with the lowest IP address automatically establishes control over all of them. Up to 18 zones will be controlled through the browser. For example, if the first NS-MNE configured is 10.15.100.150, the second (10.15.100.151) and the third (10.15.100.152) would also be controlled through the browser.

The address, when entered, may include a parameter to display the control panel in either Portrait or Landscape mode:

http://<NS-MNE IP Address>/Portrait.html

http://<NS-MNE IP Address>/Landscape.html

When no parameter is specified both screens will display and the user selects the one to use by clicking on the control screen desired.

The IP Address with parameter can be saved to a browser Favorite or Bookmark for ease of use.

MUSICA BROWSER CONTROL SCREENS

The following screens are used to access the various Musica functions through the browser interface. Some of the screens are shown in Landscape mode, some in Portrait mode; either orientation contains the same controls

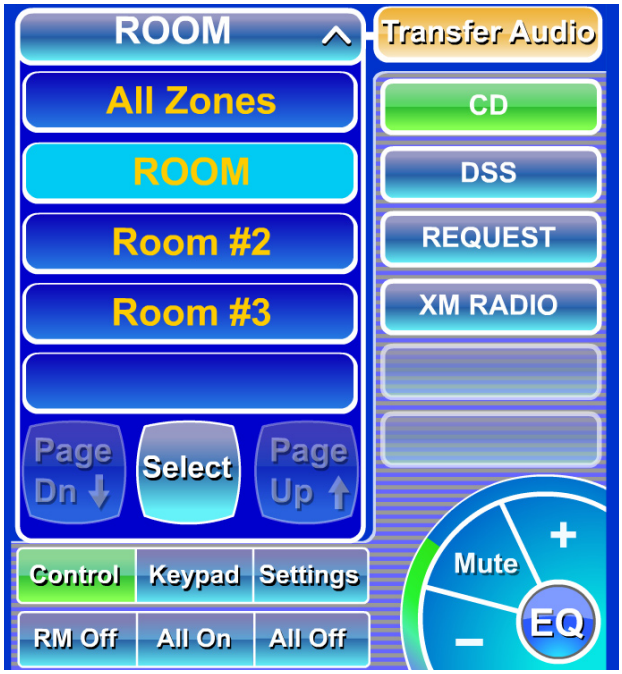
Startup Screen

This screen is first displayed after launching the browser.

No controls are functional at this point.

Room Selection

After startup, clicking on the **Room List** button displays a list of rooms within the system. In the case of systems with up to 3 sequentially addressed NM-MNE's, all the rooms served by all the ADC's will be listed.



This screen is used to select which room you wish to control, select a room.

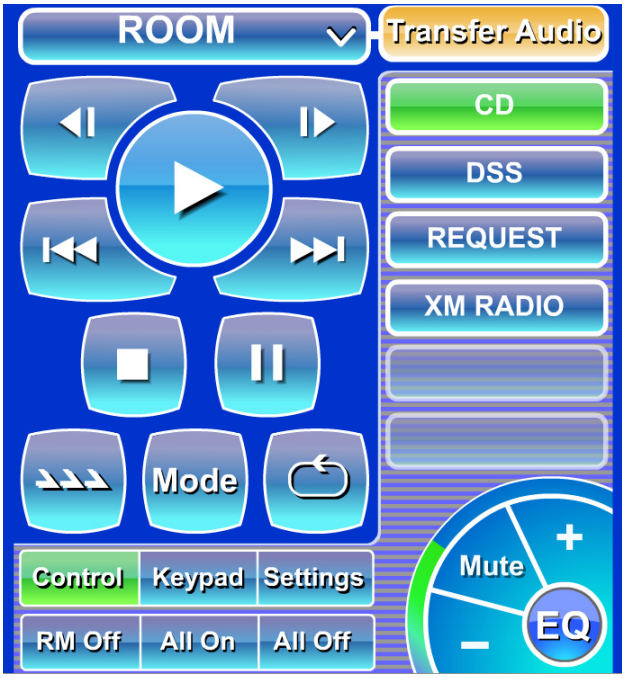
Click on a room, the click on **Select**.

Standby Screen

This screen shows the room has been selected, but that an audio source has not been selected. The audio sources available for a room using the Musica system are listed on the right hand of the screen. Select a source by clicking on its button.

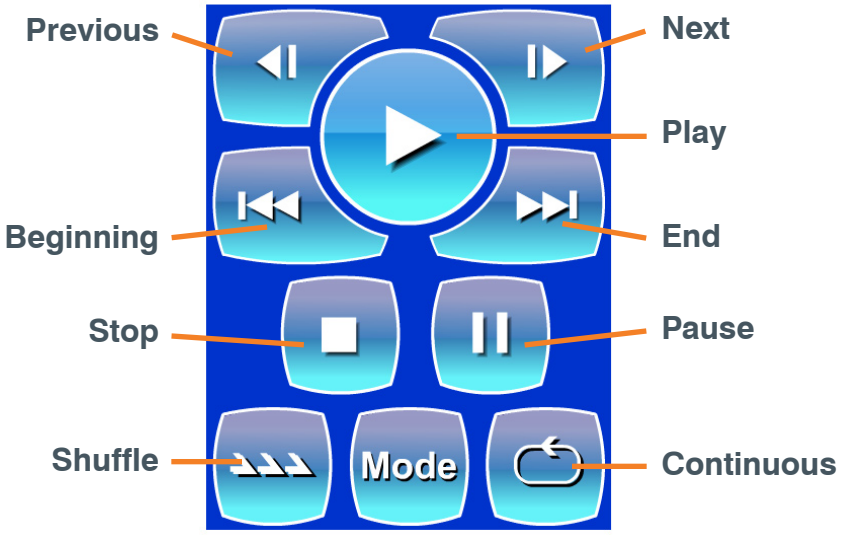
Control Screen

The audio player controls for the room and source selected appear. Note that the example shows that the CD source is selected.



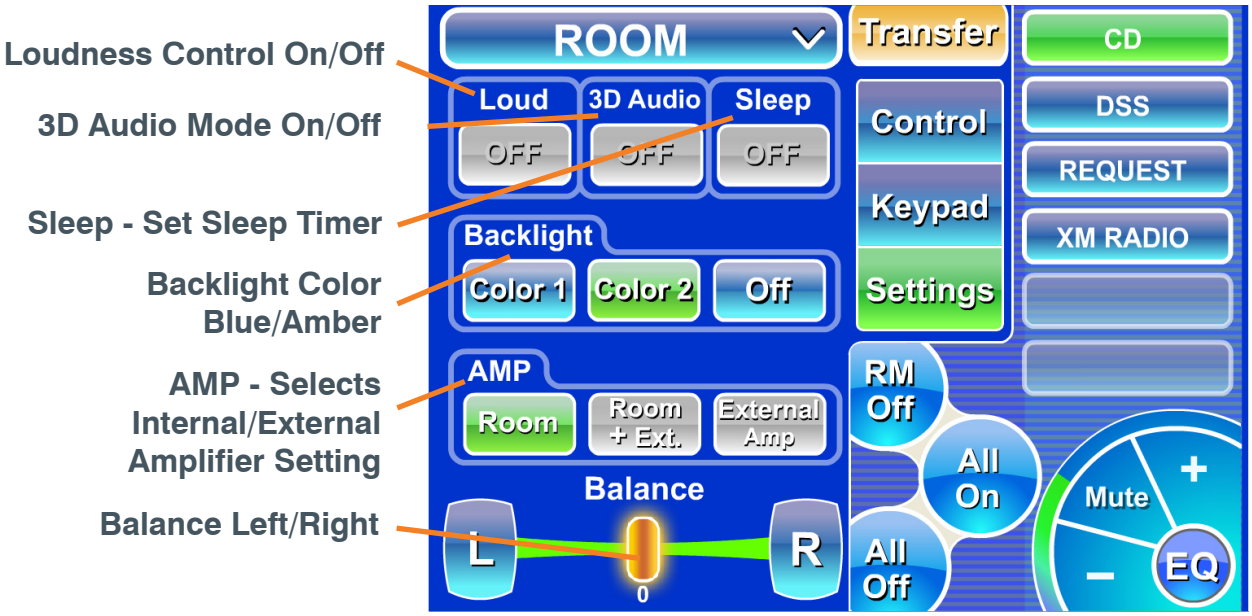
PLAYER CONTROLS

The player has controls as show below:



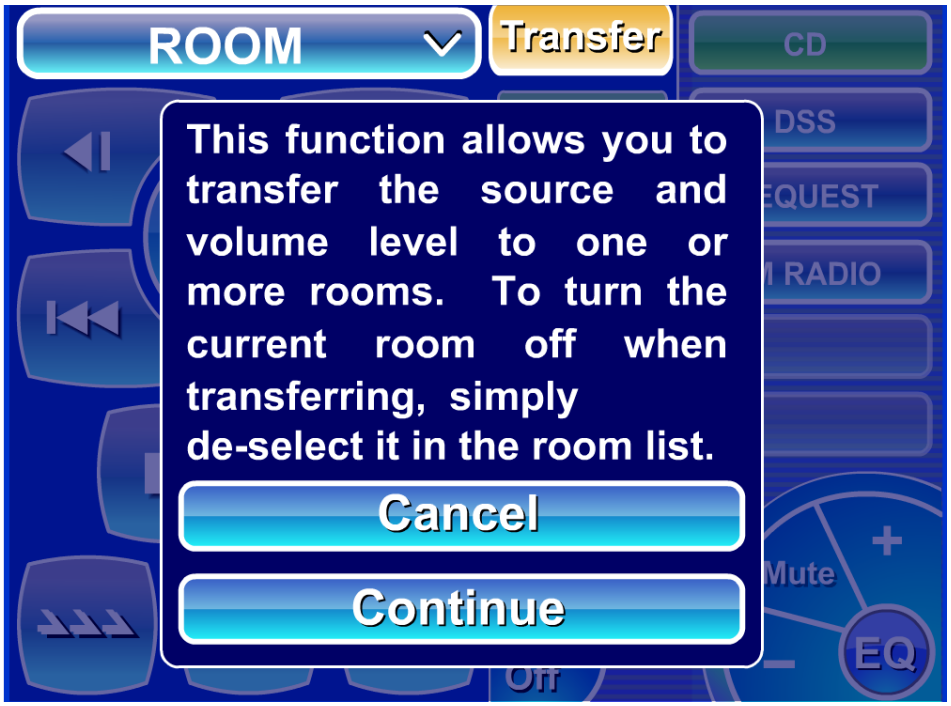
Settings Screen

The Settings screen is selected by clicking on the **Settings** button on any screen.



Transfer

The **Transfer Audio** button is used to send the same **Source** selection and **Volume** settings to another room or to multiple rooms. When clicked, a confirmation screen appears.

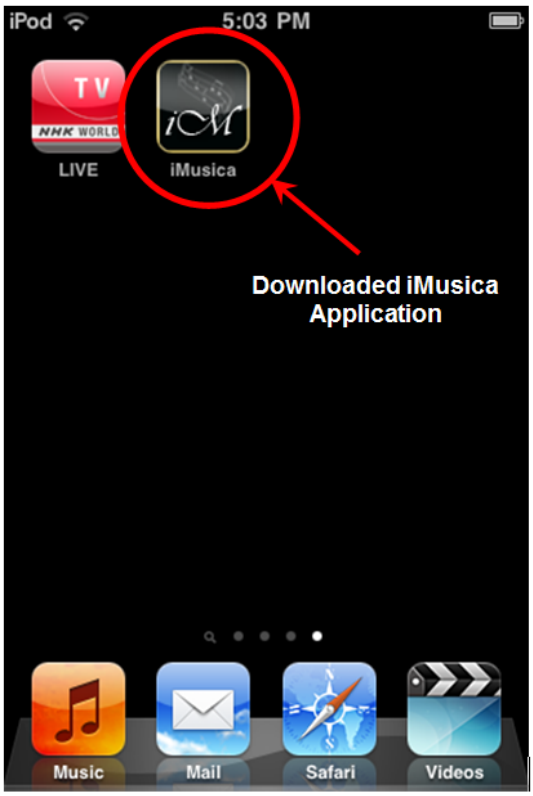


Chapter 4: Downloading, Configuring, and Using the iMusica Software

CONFIGURING iMUSICA

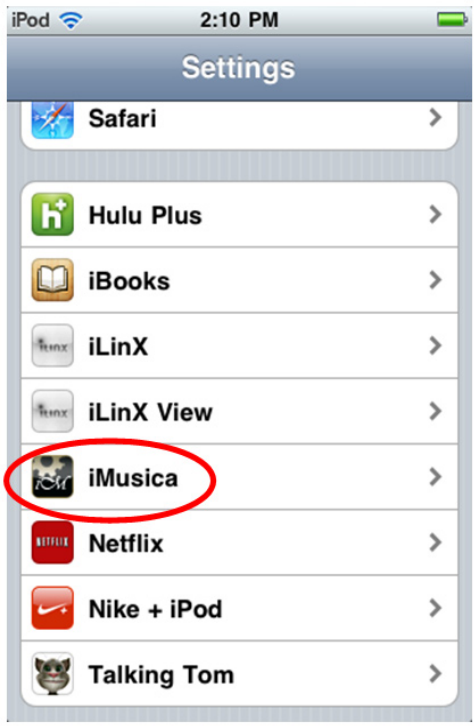
The iMusica software application is designed to allow an Apple iPhone, iPad, or iPod touch device to control the Musica devices connected to the home network using an NS-MNE interface.

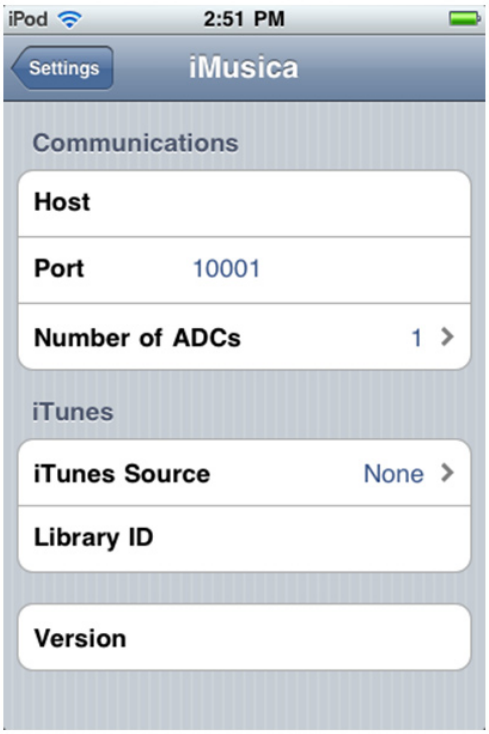
1. Download the iMusica application from the Apple iTunes Store.



2. Once the application is downloaded, configure it using the iPhone/iPad/iPod touch **Settings** tool - Typically found on the device's Home Page.

3. Scroll down the Settings Page until you come to the Applications Section. Select the **iMusica icon** to enter the iMusica setup.





The first time you enter iMusica Settings you see the screen for Host and Port configuration.

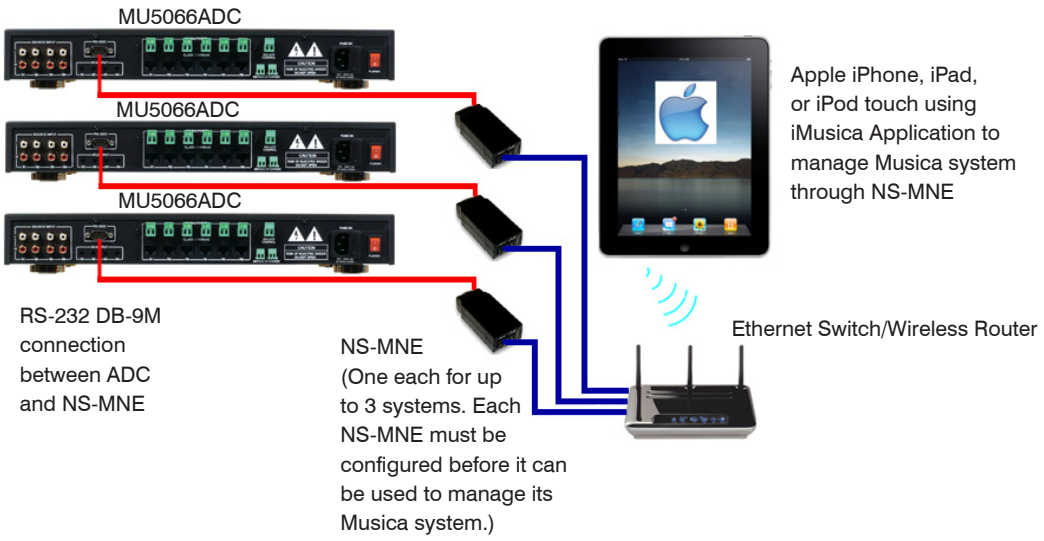
4. Touch the **Host** field and the pop-up keyboard appears.
5. Switch from Alpha to Numbers mode, and enter the IP Address you have assigned to your NS-MNE.

   » Note: If you have two or three NS-MNE's/ADC's (allowing 12 or 18 Speaker Zones), the IP addresses of the NS-MNE's must be sequential. For instance, the first NS-MNE might be 192.168.1.150, and the next two would be 192.168.1.151 and 192.168.1.152. The **lowest** IP address number is the proper address to type into this field.
6. The default Port Number of 10001 should be left as it is.
7. Set the **Number of ADCs** to the number of Musica ADCs you have in the network.
8. Select the **iTunes Source**. (Optional)

   iMusica has a feature similar to Apple's Remote App which lets you control iTunes from your iPhone/iPod Touch. This feature will allow you to pick one of the ADC's four Source inputs as an iTunes Source.

   When this Source is selected from iMusica, you will be able to Browse and Control iTunes on a PC/Mac you will pair with. If you wish to use this feature then tap the iTunes Source and select which Source you plan to have your PC/Mac with iTunes connected to.
9. The **Library ID** should be left blank.
10. The **Version** number updates after you first run iMusica .
11. Verify the NS-MNE's are connected to a Wireless Router or Access Point which you will need to

connect to wirelessly with your iPhone/iPad/iPod Touch. (See below)


MU5066ADC
MU5066ADC
MU5066ADC
Apple iPhone, iPad, or iPod touch using iMusica Application to manage Musica system through NS-MNE
Ethernet Switch/Wireless Router
RS-232 DB-9M connection between ADC and NS-MNE
NS-MNE (One each for up to 3 systems. Each NS-MNE must be configured before it can be used to manage its Musica system.)

» Note: iTunes from a PC

If you plan to use the iTunes feature, then the computer which will have the iTunes Library will also need to be physically or wirelessly connected to the same Ethernet device the NS-MNE's are plugged in to. (See the **Operating iMusica with iTunes** section of this manual for more instruction on configuring for iTunes.)

OPERATING THE MUSICA ADC WITH iMUSICA

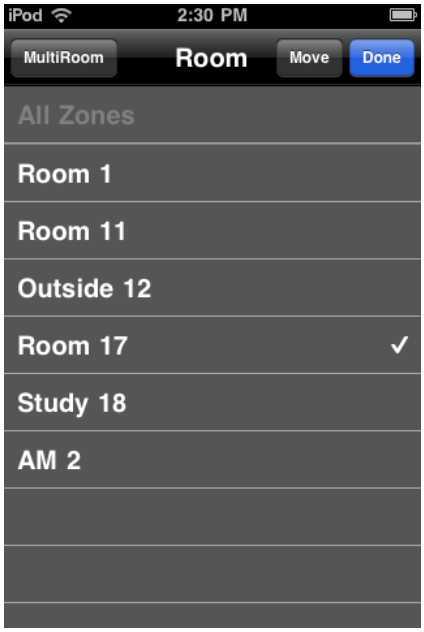
The following screens are used to access the various Musica ADC functions through the iMusica interface. The iMusica interface contains the same controls as the Flash-enabled browser interface. The interface is designed to be intuitive so not all controls are described.

Startup Screen

This screen is first displayed after launching. No controls are functional at this point.

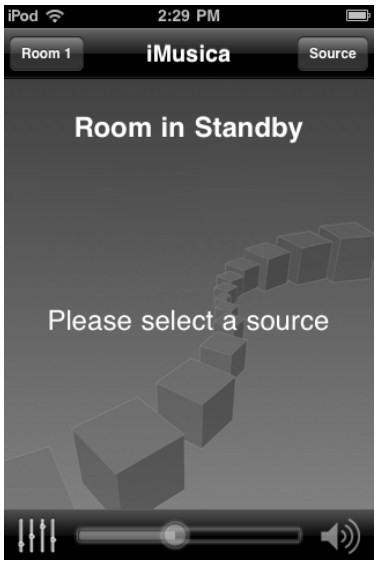
Room Selection

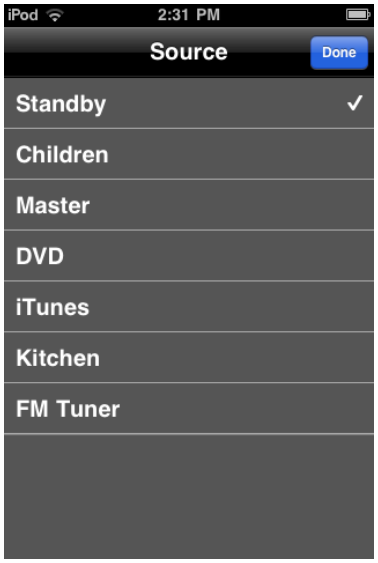
After startup, clicking on the **Room List** button displays a list of rooms within the system. In the case of systems with up to 3 sequentially addressed NM-MNE's, then all the rooms served by all the ADC's will be listed. Select which room you wish to control. Selected rooms are checked. Use the **Done** button to exit the Room screen.



Standby Screen and Source Selection Screen

The first screen below identifies the room that has been selected, but that an audio source has not been selected. Access the audio sources available for a room using the **Source** button. The second screen shows a list of sources. Select a source and use the **Done** button to exit the Source selection screen.



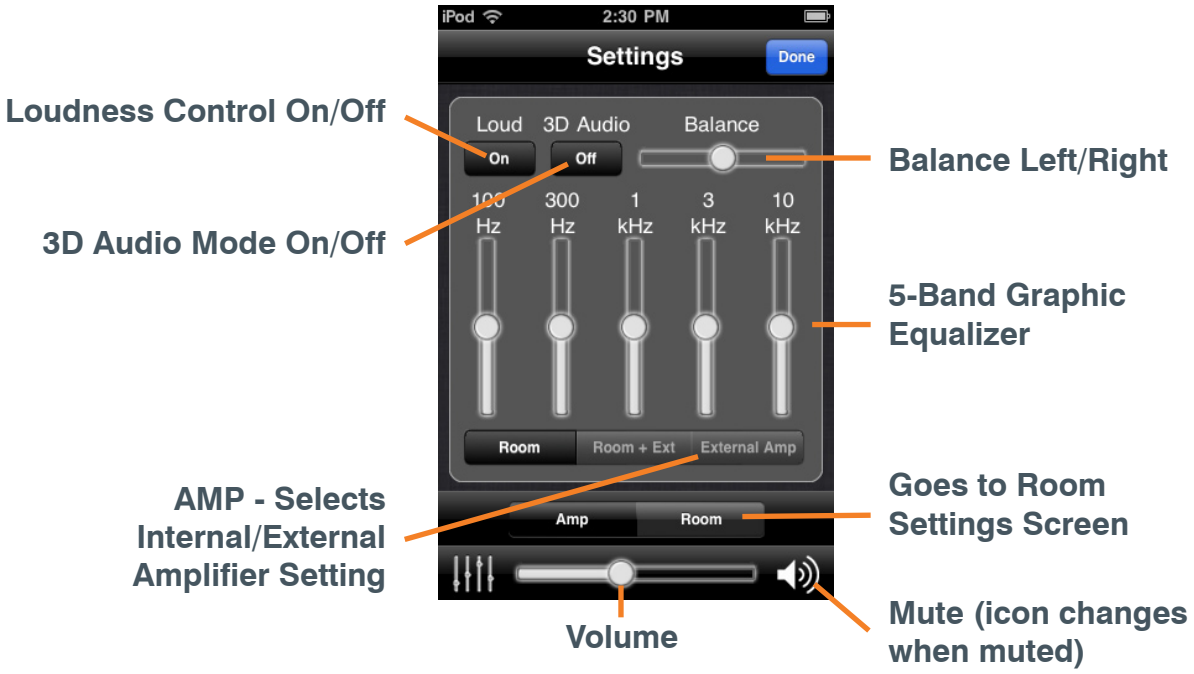


Player Control Screens

There are two Control Screens: One for the player, the other for the amplifier controls. The audio player control screen shows the standard controls usually found in an audio player.

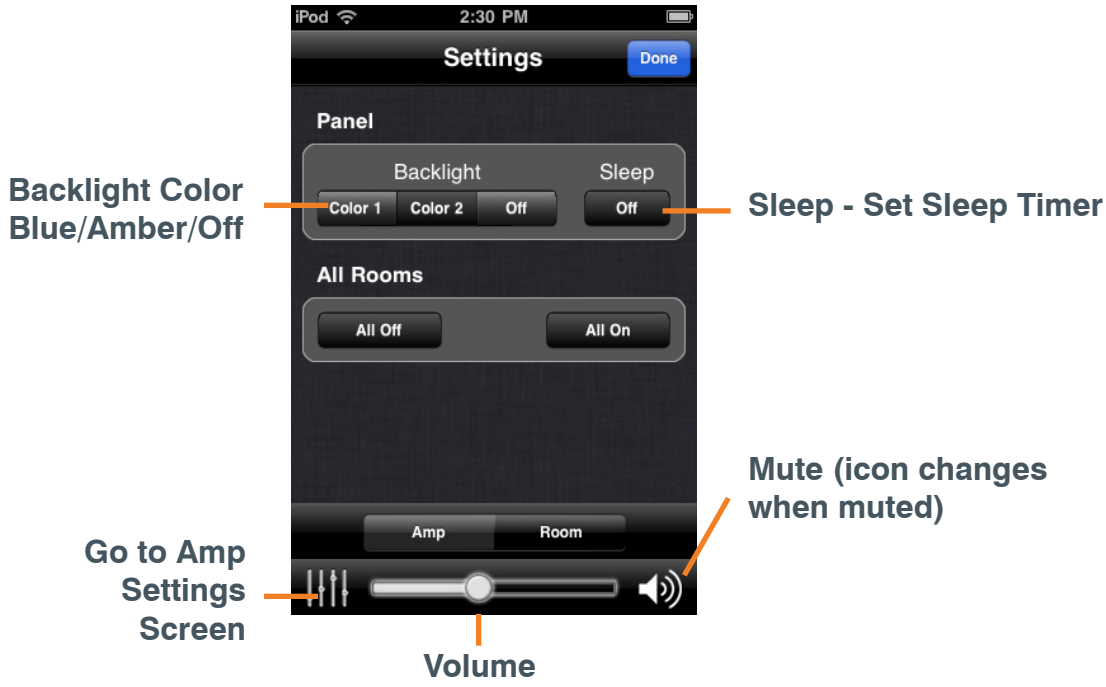
Amp Settings Screen

The Amp Settings screens provides additional audio control of the Musica ADC including 5-Band Graphic Equalizer, Loudness, Balance, and 3D Audio Mode control. Use the **Done** button to exit the Amp Settings screen.



Room Settings Screen

The Room Settings screens provides backlight color control of the panel, sleep time control, and the ability turn off/on all rooms in the system. Use the **Done** button to exit the Room Settings screen.



Tuner Screens

There are two tuner screens, one that accesses preset stations on the tuner, and a manual-mode keypad screen that allows entry of the station frequency.

» Note: A Musica FM Tuner card must be installed into the room Keypad for any room requiring an FM Tuner. and it must be selected as Source.

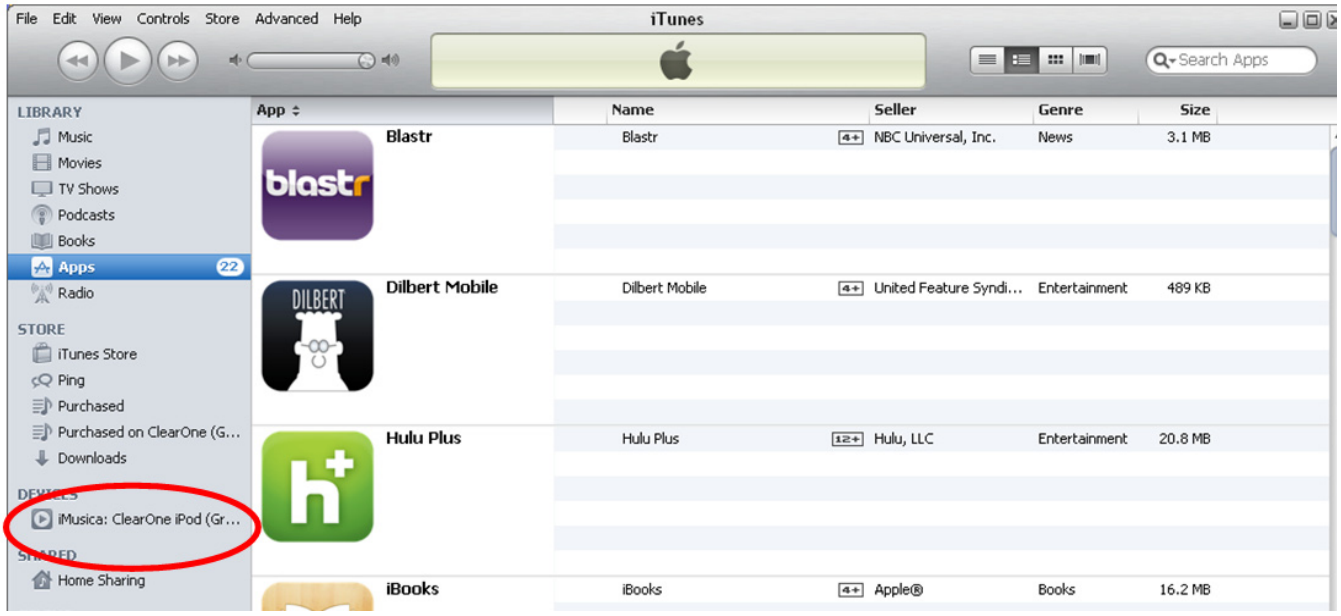
Chapter 5: Using iTunes with iMusica

With the iMusica interface controlling the Musica ADC through the NS-MNE, iTunes can become an audio source for your Musica system. To do this, iMusica will need to pair with iTunes on the computer you are planning to use as the Source.

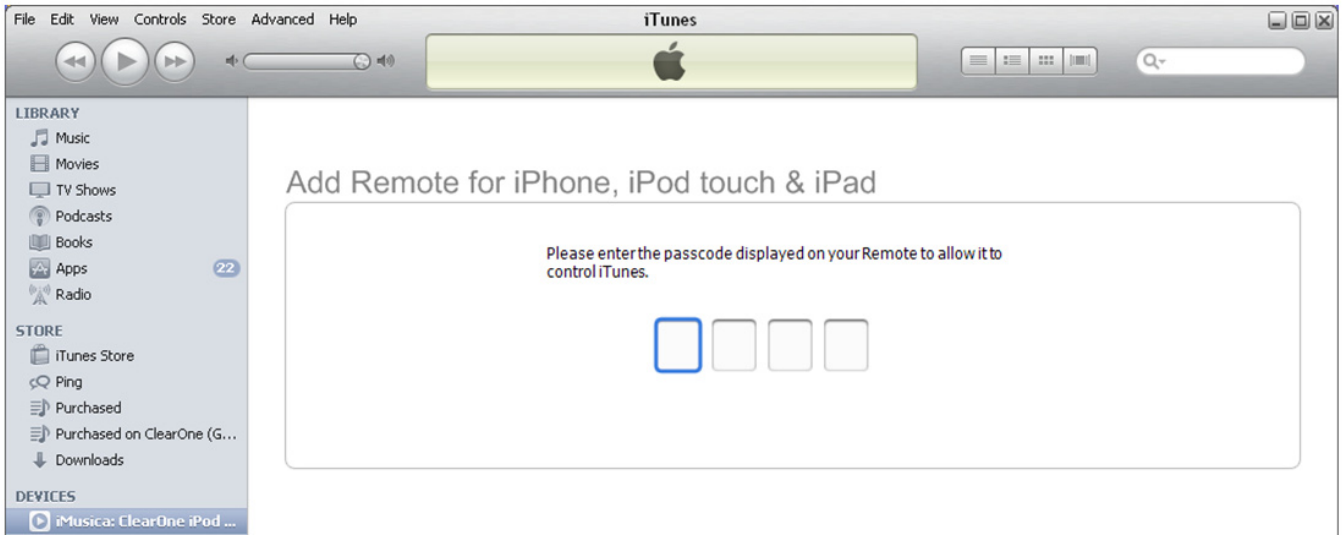
Perform the following:

1. Select iTunes as the source from any room. iMusica will display the following as it is connecting:

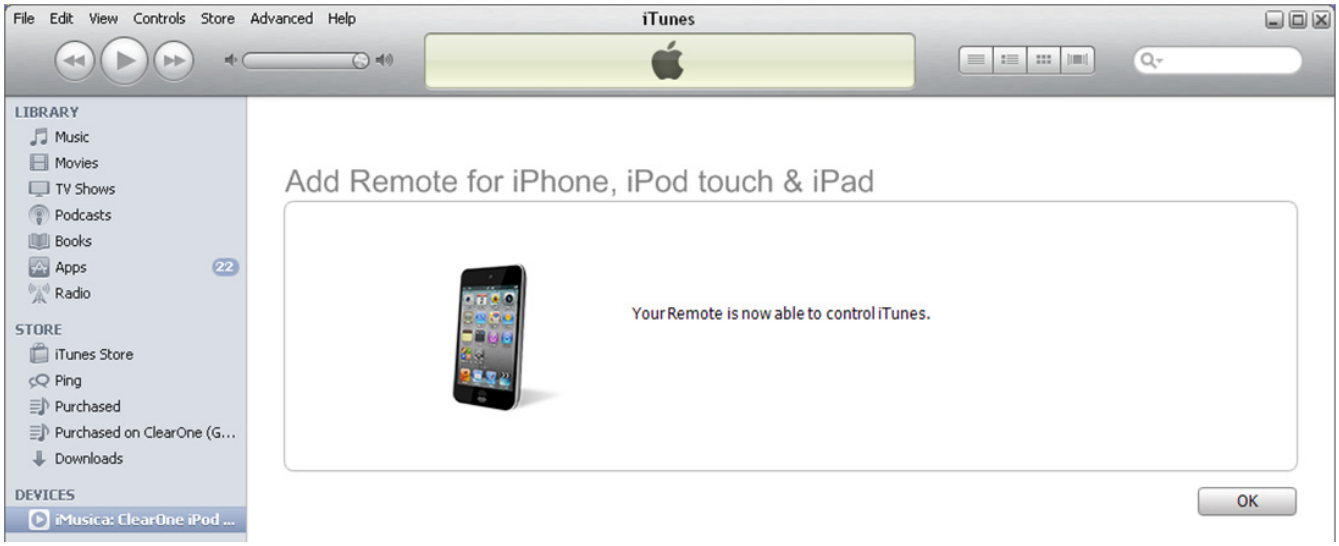
2. When connected, in iTunes you will see the name of your device running iMusica.



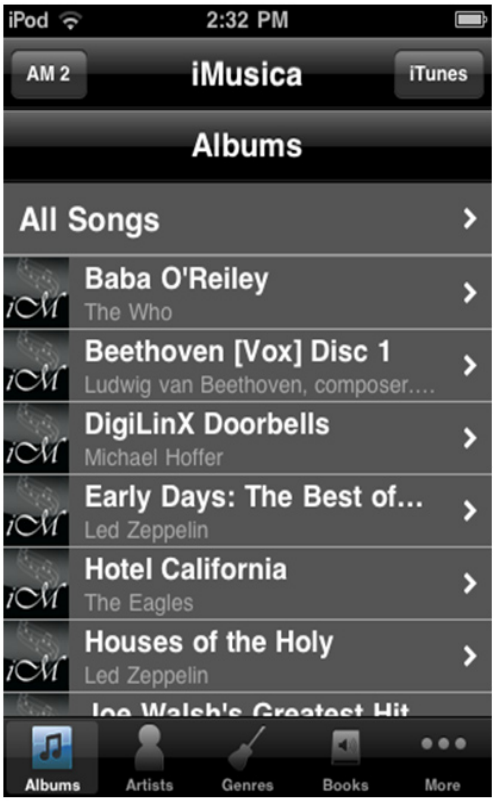
3. Click on the device name and iTunes will display the following Pairing Screen:



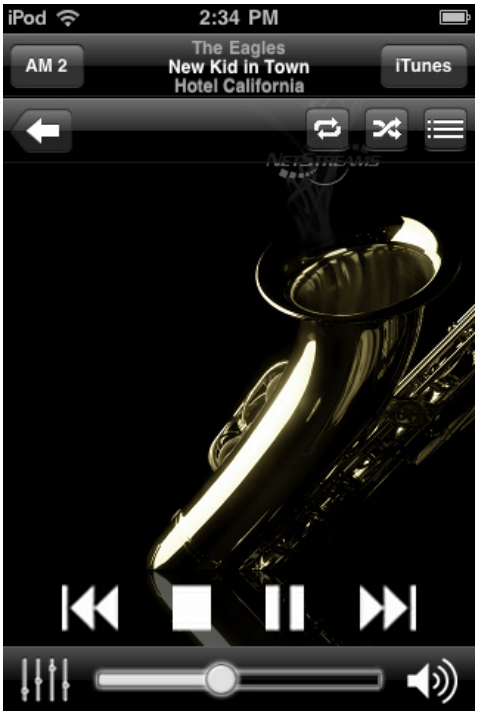
4. Enter the **passcode** (0000, four zeroes). This will complete the Pairing process and iTunes will display a confirmation.



5. Click **OK**. The iMusica application will index the computer's iTunes Library and display a screen similar to the following:



6. iMusica goes to the Player Screen once a song begins:



7. The Transport Control will now control iTunes on the Paired Computer.

PAIRING WITH A DIFFERENT iTUNES LIBRARY

If you later want to Pair to a different iTunes Library on another Computer, you need to go back into the Settings Tool as when iMusica was first configured. You will see a screen similar to this:

Touch the Library ID field and erase its contents to delete the Pairing. The Pairing process will start again the next time iMusica is run and a Room selects iTunes as a Source.

NS-MNE Technical Specifications

SPECIFICATIONS

- **Hardware**

  32-bit NET+ARM high-performance RISC processor (NS7520 55 MHz)

  4 MB Flash and 16 MB RAM

  RS-232 or switch-selectable RS-232/422/485 serial interface (DB-9M connector)

  - Throughput up to 230,400 bps
  - 7/8 data bits
  - 1/1.5/2 stop bits
  - None/even/odd parity
  - Software/hardware flow control

  Auto-sensing 10/100 Mbit Ethernet interface and network link

- **Wired LAN Interface**

  10BASE-T
  100BASE-TX (Automatic Recognition)

- **Musica ADC Interface**

  RS-232 Female

- **Power**

  9-30 VDC @ 370 mA power supply included

- **Dimensions**

  Length: 3.876 in (9.846 cm)
  Width: 1.680 in (4.267 cm)
  Depth: 0.999 in (2.537 cm)
  Weight: 2.29 oz (6.50 g)

- **Weight**

  2.29 oz (6.50 g)

- **Environmental**

  Storage temperature:
  -40° C to 90° C (-40° F to 194° F)

  Operating temperature:
  0° C to 60° C (32° F to 140° F)

  Relative Humidity:
  5% to 90% (non-condensing)

  Altitude:
  12,000 Feet (3658 Meters)

- **Indicators**

  Network link
  Ethernet activity
  Power (red)

- **Regulatory Approvals**
  FCC Part 15, Class A
  EN 55022
  EN5J024
  VCCI
  AS 3548
  UL60950
  CSA 22.2 NO. 60950
  EN 60950

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